CAN INDONESIAN PALM SUGAR COMPETE? AN ANALYSIS OF COMPARATIVE ADVANTAGE, INFLUENCING FACTORS, AND COMPETITIVE POSITION

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ABSTRACT

Indonesian palm sugar commodities still face challenges such as household-scale production industries, lack of farmers' knowledge, and quality standard compliance. There is a need to improve the processing industry and quality to meet national and international standards. This study analyzes and evaluates the competitiveness of Indonesian palm sugar in the international market using secondary data from 1998-2022 with quantitative descriptive statistics methods. Revealed Comparative Advantage (RCA) analysis shows that Indonesian palm sugar was not competitive from 1998 to 2010, with a value of <1, but became competitive from 2011 to 2022 with a value of >1. Error Correction Model (ECM) analysis reveals that factors affecting the competitiveness of palm sugar were export volume and export price, while the exchange rate of Rupiah to US Dollar and Indonesia's Gross Domestic Product (GDP) per capita had no impact. The competitive position of Indonesian palm sugar using Export Product Dynamic (EPD) shows an average position of falling star, followed by rising star, retreat, and lost opportunity. This study highlights the importance of developing Indonesia's palm sugar industry by focusing on increasing industrial scale, improving production processes, enhancing product quality, and ensuring sustainability. The government plays a crucial role in providing technical support, as farmers and producers often lack sufficient knowledge. Scaling up the industry is vital to meet domestic and international demands, while accessible, comprehensive, and updated data is needed to keep the public informed about the industry's growth and progress.

Keywords: competitive analysis, export, international market, palm sugar

BACKGROUND

One of Indonesia's leading local commodities in the sugar sector is palm sugar (Astuti et al., 2021). Palm sugar has a low glycemic index, antioxidants, a source of iron, and various other nutrients, making it considered healthier than other conventional sugars (Framita et al., 2021; Rianse et al., 2019; Syahidah et al., 2023). Its diverse nutritional content is one of the advantages of palm sugar. Product variations such as liquid sugar, palm sugar, and molded sugar can increase product value and help improve farmers' productivity. The National Standardization Agency of Indonesia in Technical Guidelines for Palm Sugar Product Certification Scheme (Skema Sertifikasi Produk Gula

Palma, 2019) has defines palm sugar as the processed result of palm tree sap, including sugar palm (*Arenga piñata Merr*.), coconut (*Cocos nucifera*), palmyra palm (*Borassus flabellifer L*), or other palm types, in molded or powder and granular forms.

The profit margin of Indonesian palm sugar marketed in modern and export markets is much higher than in traditional markets, which is expected to improve the welfare of palm sugar producers (Suliyanto et al., 2019). Indonesia's palm sugar export destinations have reached nine countries, including the Netherlands, Brazil, Spain, Saudi Arabia, South Africa, the United States, Australia, France, and Canada (Ministry of Trade Republic of Indonesia, 2024). In 2022, Indonesia successfully exported palm sugar products with HS code 170290 of 34,538,666 kg (UN Comtrade, 2024). As one of the palm sugar-producing countries, Indonesia has entered the international market, evidenced by export destinations in several major countries. This presents a significant opportunity for Indonesia to be competitive in this market.

Industrial productivity can also improve export performance by considering several aspects, one of which is the level of domestic and global commodity supply (Goestjahjanti et al., 2023). Palm sugar processing in Indonesia is still considered a traditional household-scale business, causing the palm sugar supply to be very fluctuated (Abdullah et al., 2020). From these two statements, it can be seen that there are imbalances in the palm sugar industry in Indonesia. These supply fluctuations are an important issue as they affect total productivity and can cause disruption to exports to international markets. In other side, the Indonesian palm sugar industry faces issues from the risks to the sap-producing plants to the production process. Education, knowledge, and production quality are also other obstacles for the Indonesian palm sugar commodity to expand its market share. According to Gunawan et al. (2020) and Witno et al. (2022), the low level of education and skills makes Indonesian palm sugar farmers less competitive and unfocused on sugar palm cultivation, as well as a lack of marketing knowledge. Musita (2019) and Susi (2013) add that palm sugar artisans face problems with inconsistent quality and failure to meet national and international market quality standards.

To address the challenges of meeting quality standards, it is essential to consider both the technical aspects of production and the market-driven innovations that can enhance the product's appeal. Syahidah et al. (2023) states that the quality of palm sugar is greatly influenced by the production process. This is because the tapped palm sap is very susceptible to fermentation if no preservatives are added to the tapping container. Pratiwi et al. (2022) also add that creative palm sugar product development can be driven by innovations in product, packaging, and marketing, aligned with consumer preferences. Understanding consumer preferences and satisfaction is key to creating competitive products and improving unsatisfactory ones.

The main research question for the Indonesian palm sugar industry is whether it can compete and expand its market share in the international market. Analyzing competitiveness trends in changing market conditions, the role of policies, and economic conditions is considered very important for strategic decision-making in the Indonesian palm sugar industry in the future. We will answer this question by dividing it into three main analyses. The first is to analyze the comparative advantage, the second is to analyze the factors affecting competitiveness, and the third is to analyze the competitive positions. All of these analyses have included competitive and comparative analyses of competitiveness thus they can answer the entire problem formulation.

RESEARCH METHODS

Data and Data Collection Method

The data used in this study is secondary data in the form of time series data from 1998-2022 (25 years). According to the Ministry of Trade of the Republic of Indonesia (2017), sugar products classified under the Palmae class usually have HS code 170290 (Sugars in solid form, including inverted sugar and chemically pure maltose, and sugar and sugar syrup).

The collection methods used include observation, documentation, and literature study. The data was obtained from research data source in Table 1.

Table 1. Research Data Source

No.	Data	Unit	Year	Source
1	Export value of world palm sugar to the international market	USD	1998-2022	Trade Map, UN Comtrade
2	Total export value of the world to the international market	USD	1998-2022	Trade Map, UN Comtrade
3	Export value of Indonesian palm sugar to the international market	USD	1998-2022	Trade Map, UN Comtrade
4	Total export value of Indonesia to the international market	USD	1998-2022	Trade Map, UN Comtrade
5	Export volume of Indonesian palm sugar	Ton	1998-2022	UN Comtrade
6	Export price of Indonesian palm sugar	USD	1998-2022	UN Comtrade
7	Gross domestic product per capita of Indonesia	USD	1998-2022	World Bank
8	Exchange rate of IDR against USD	IDR	1998-2022	World Bank

Measurement and Data Analysis Method

The data measurement method used in this study is ratio measurement. This study uses tools to facilitate data processing, namely Microsoft Excel and EViews 12 software. Data analysis will be conducted according to the research objectives.

Data analysis will be carried out in accordance with the research objectives, consisting of analyze the comparative advantage of Indonesian palm sugar in the international market, analyze the factors affecting competitiveness of Indonesian palm sugar in the international market, and to analyze the competitive positions of Indonesian palm sugar in the international market.

Analysis of the Comparative Advantage of Indonesian Palm Sugar in the International Market Using RCA

RCA analysis is used based on the fact that RCA analysis results can indicate whether a commodity has a comparative advantage or not. This comparative advantage can be seen from the competitiveness index in RCA analysis using "Balassa Index" in Equation 1. RCA analysis in this study uses Microsoft Excel software.

$$RCA = \frac{\frac{Xij}{X.j}}{\frac{Xiw}{X.w}} \tag{1}$$

Source: Balassa (1965)

Where:

Xij   : Export value of Indonesian palm sugar to the international market (USD)

X.j   : Total export value of Indonesia to the international market (USD)

Xiw   : Export value of world palm sugar to the international market (USD)

X.w   : Total export value of the world to the international market (USD)

Analysis of Factors Affecting the Competitiveness of Indonesian Palm Sugar in the International Market Using ECM

The ECM method is used to analyze the influence of independent variables on the dependent variable in the short and long term. ECM analysis in this study uses EViews 12 software. ECM analysis will use long-term and short-term equation models.

The ECM method is used to analyze the effect of independent variables on the dependent variable in the short term and long term. The ECM analysis will use Engle & Granger (1987) analysis method. The ECM analysis in this study uses EViews 12 software.

The determination of the variables used in this study comes from several literatures which can be seen in the Table 2.

Table 2. Influence Relationship Between Dependent and Independent Variables

No.	The Influence of Variables	Previous Study
1	RCA Value → Export Volume	(Apriani et al., 2020; Rochdiani & Wulandari, 2023; Rosyadi et al., 2021)
2	RCA Value → Export Price	(Admi et al., 2022; Apriani et al., 2020; Ashari et al., 2016)
3	RCA Value → Exchange Rate	(Admi et al., 2022; Anwar, 2019; Apriani et al., 2020)
4	RCA Value → GDP per Capita	(Admi et al., 2022; Anwar, 2019; Rochdiani & Wulandari, 2023)

Model estimation is transformed into ln (natural logarithm) form in order to deal with normality issues. The ECM analysis in this study will use the long-term and short-term equation models with the Equation 2 and Equation 3.

1. Equation (2) Long-term equation model:

$$\Delta RCAG_t = X_1 LNVXGI_t + X_2 LNHXGI_t + X_3 LNNKURS_t + X_4 LNGDPN_t + C + Z_t \tag{2}$$

2. Equation (3) Short-term equation model:

$$\Delta RCAG_t = X_1 LNVXGI_t + X_2 LNHXGI_t + X_3 LNNKURS_t + X_4 LNGDPN_t + C + ECT + Z_t \tag{3}$$

Where:

RCAG   : Competitiveness value of Indonesian palm sugar

HXGI   : Export price of Indonesian palm sugar (USD)

VXGI   : Export volume of Indonesian palm sugar (Ton)

NKURS : Exchange rate of IDR against USD (IDR)
GDPN : Gross domestic product per capita of Indonesia (USD)
ECT   : Error Correction Term
Z   : Error in period t

Analysis of the Competitiveness Position of Indonesian Palm Sugar in the International Market Using EPD

   The market attractiveness measurement is based on the demand growth of a product for a particular market, while business strength is measured through the growth of a country's market share in that market. The combination of these two factors results in the characteristic position of the product being analyzed into four categories: rising star, falling star, lost opportunity, and retreat (referring to Figure. 1). EPD analysis in this study will use Microsoft Excel software.
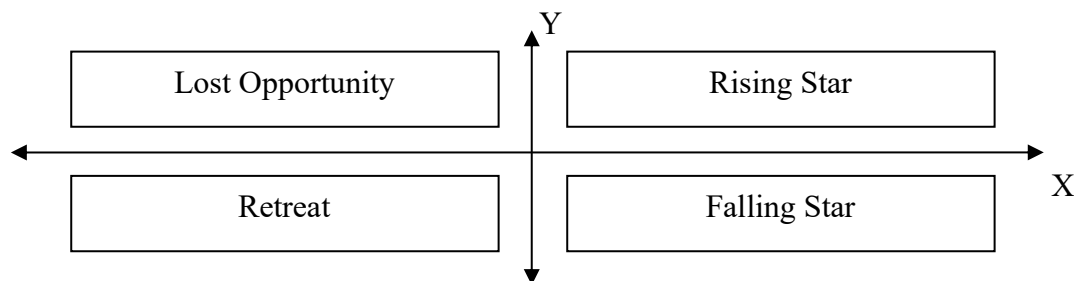

Figure 1. Export Product Dynamics (EPD) Matrix
Source: Esterhuizent (2006)

   After identifying the category in the market position analysis in Figure 1, the next step is to calculate the EPD to determine the market position each year through the calculation of the X and Y axes using the Equation 4 and Equation 5:

$$X\ Axis = \frac{\sum_{t-1}^{T}\left[\left(\left(\frac{X_{ij}}{W_{ij}}\right)t \times 100\%\right) - \left(\left(\frac{X_{ij}}{W_{ij}}\right)t - 1 \times 100\%\right)\right]}{T} \qquad (4)$$

$$Y\ Axis = \frac{\sum_{t-1}^{T}\left[\left(\left(\frac{X_{j}}{W_{j}}\right)t \times 100\%\right) - \left(\left(\frac{X_{j}}{W_{j}}\right)t - 1 \times 100\%\right)\right]}{T} \qquad (5)$$

Where:
X Axis : Growth rate of Indonesian palm sugar export market share in the international market (%)
Y Axis : Growth rate of total Indonesian export market share in the international market (%)
Xij   : Export value of Indonesian palm sugar to the international market (USD)
Wij : Export value of world palm sugar to the international market (USD)
Xj : Total export value of Indonesia to the international market (USD)
Wj : Total export value of the world to the international market (USD)
t   : Year t
t-1 : Previous year

T   : Number of analysis years (1998-2022)

After obtaining the results on the X and Y axes from 1998-2022, the next step is to determine the position according to the description presented in Table 3 below.

Table 3. Market Position of Export Product Dynamics (EPD)

Quadrant	Posision	Description
Quadrant I	Rising Star	Indonesian palm sugar becomes a dynamic and competitive product in the international market.
Quadrant II	Lost Opportunity	Decreased dynamic market share of Indonesian palm sugar export, leading to lost export reach in the international market.
Quadrant III	Retreat	Indonesian palm sugar export is no longer desired in the international market.
Quadrant IV	Falling Star	Indonesian palm sugar tends to be stagnant and does not develop in the fluctuating international trade market.

Source: Nabi & Luthria (2002) and Esterhuizent (2006), processed (2024)

RESULT AND DISCUSSION

Comparative Advantage Analysis Using Revealed Comparative Advantage (RCA)

The analysis presented in Figure 2 shows that the Indonesian palm sugar commodity had an RCA value of <1 from 1998 to 2010, indicating it was not competitive in the international market.
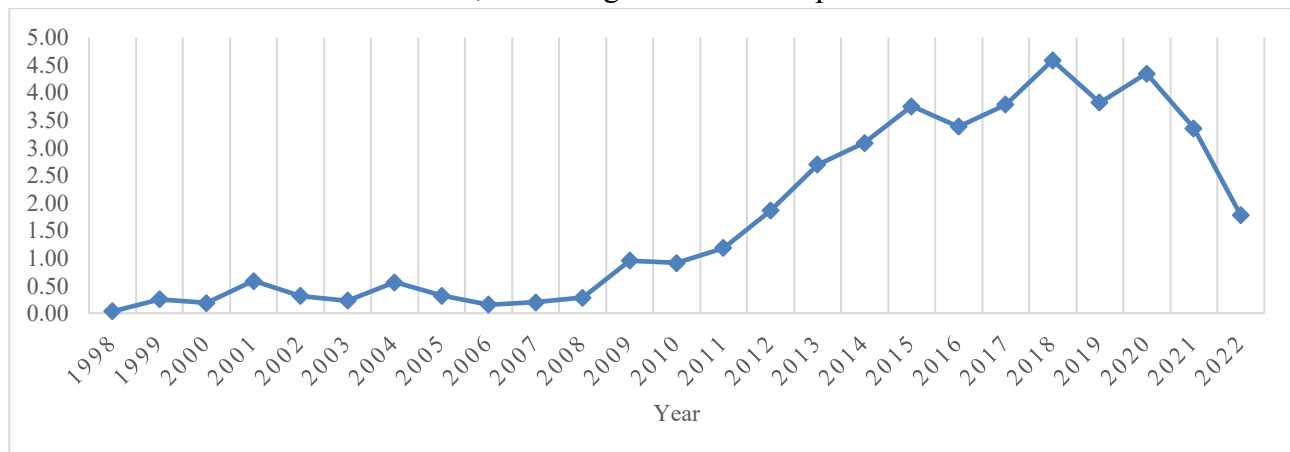

Figure 2. RCA Value of Indonesian Palm Sugar in the International Market from 1998-2022

The resulting analysis in Figure 2 shows that the Indonesian palm sugar commodity in 1998-2010 showed that Indonesian palm sugar was worth <1, which means it is not yet competitive in the international market. In contrast, the RCA value in 2011-2022 was >1, which means it is competitive in the international market. Overall, the upward trend in RCA values demonstrates Indonesia's growing capability to compete in the global market for palm sugar, showcasing the industry's potential as a significant contributor to the country's export economy.

Based on data from Trade Map (2024) that has been processed and ranked, the export value of palm sugar in Indonesia from 1998-2010 never ranked among the top 15. In 2006, Indonesia was ranked 42nd out of 111 palm sugar exporting countries in the international market, the lowest ranking for this sector. However, from 2011 to 2022, Indonesia's average ranking improved to 12th in the international market. The highest achievement was in 2018, with an RCA value of 4.59, ranking 6th in the international market.

The development of the Indonesian palm sugar industry is closely tied to government efforts. The self-sufficiency program for non-cane sugar is one of the government's efforts to enhance the productivity of the palm sugar industry in Indonesia. This effort is supported by local government initiatives to develop MSMEs (Micro, Small, and Medium Enterprises). According to Kusumanto (2016), the policy to achieve national sugar self-sufficiency began in 2009. This policy increased the opportunities for plantations and other sugar industries such as palm, coconut, nipah, and lontar. Bariroh (2016) states that local governments are developing coconut sugar MSMEs through technical assistance, including training, entrepreneurship, technological knowledge, marketing, and access to credit from financial institutions.

The decline in Indonesian palm sugar export value reached -23% in 2021 and further decreased to -47% in 2022. This decline was due to consecutive drops in exports, from 77,441 tons in 2020 to 53,854 tons in 2021 and 34,538 tons in 2022. This decline can also be attributed to the increasing consumer awareness of product quality in the global palm sugar market. Indonesian palm sugar producers need to understand and improve the quality of their products, as well as understand the needs and trends of the palm sugar market internationally. Gunawan et al. (2020) states that brown sugar processing in Indonesia often results in low and variable quality due to uncontrolled temperatures, approximate cooking times, and inconsistent stirring. According to Abdullah et al. (2019), consumer perceptions and preferences are based on aroma, taste, texture, and color. Evaluating consumer preferences is necessary to improve product quality, enhance satisfaction, and increase purchase interest. Buencillo (2022) add that coconut sugar products require intensive promotion to increase consumer awareness and expand market share.

Factors Influencing Competitiveness Using Error Correction Model (ECM)
1. Unit Root Test

This study uses the Augmented Dickey-Fuller (ADF) cointegration test. This test is the first stage of time series data analysis. The unit root test results are presented in Table 4.

Table 4. ADF Stationarity Test Results on First Difference

Variabel	ADF Value	Critical Value 5%	Probability	Description
RCA Value	-6.773270	-2.998064	0.0000	Stationary
Export Volume	-5.983317	-2.998064	0.0001	Stationary
Export Price	-5.976679	-2.998064	0.0001	Stationary
Exchange Rate	-5.582347	-2.998064	0.0001	Stationary
GDP per Capita	-4.347538	-2.998064	0.0026	Stationary

In the Level test, only variable GDP per capita is stationary at the Level, while the variables of RCA value, export volume, export price, and exchange rate are not stationary at the Level. Therefore, it is necessary to conduct a stationary test on the First Difference that presented in Table 4. This is in line with Prayogo (2017) that when time series data does not show a constant average, differencing is performed on the data, namely by calculating successive changes in the series for all variables.

2. Classical Assumption Test

The classical assumption test is conducted to determine whether the data is normally distributed or not and to determine whether there is an indication of heteroscedasticity and autocorrelation symptoms. In this study, three classical assumption tests were carried out, namely the normality test (Figure 3), autocorrelation test (Table 5), and heteroscedasticity test (Table 6).

The normality test in this study uses Jarque-Bera to check the residuals of the regression model. If the Jarque-Bera probability value exceeds $\alpha = 5\%$, then the residuals are considered normally distributed. The following is a histogram of the results of normality testing conducted using the Jarque-Bera test shown in Figure 3.
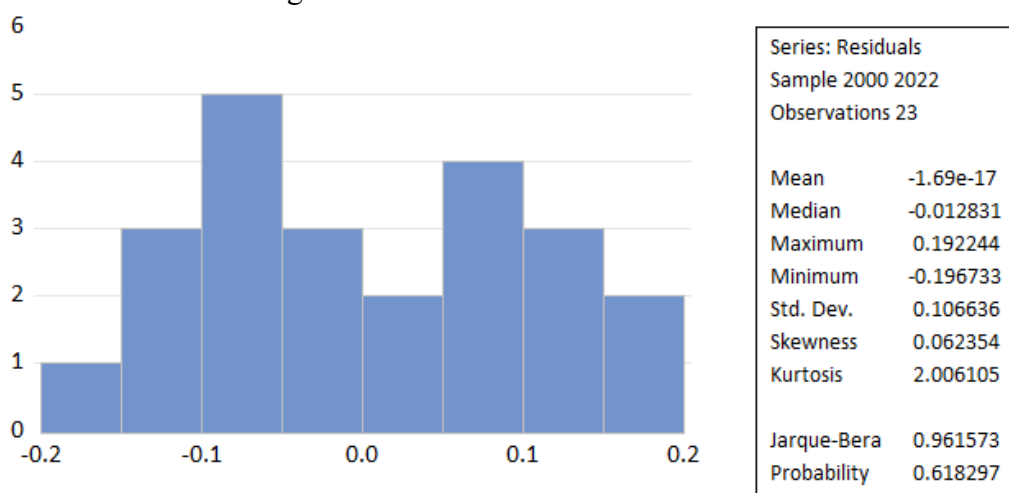

Series: Residuals	
Sample 2000 2022	
Observations 23	
Mean	-1.69e-17
Median	-0.012831
Maximum	0.192244
Minimum	-0.196733
Std. Dev.	0.106636
Skewness	0.062354
Kurtosis	2.006105
Jarque-Bera	0.961573
Probability	0.618297

Figure 3. Normality Test Results

Figure 3 shows the probability value of 0.618297, the value is smaller than the value of $\alpha = 5\%$. It can be concluded that the data in this study is normally distributed and does not experience normality deviations in the ECM model.

The autocorrelation test in this study is conducted by the Breusch-Godfrey test or Lagrange Multiplier test (LM test) which is shown in Table 5.

Table 5. Autocorrelation Test Result

F-statistic	1.162533	Prob. F (2,15)	0.3393
Obs*R-squared	3.086655	Prob. Chi-Square (2)	0.2137

Table 5 shows that the Chi-Square probability value is 0.2137 > 0.05 which means that there is no autocorrelation deviation in this ECM model. Heteroscedasticity testing is carried out to detect

whether or not there is a violation of the classical assumption of heteroscedasticity, namely the inequality of residual variances in all observations in the regression model. According to Zahriyah et al. (2020), heteroscedasticity is one of the factors that makes simple linear regression models less efficient and accurate, and also interferes with the use of the maximum likelihood method in estimating regression coefficient parameters. The heteroscedasticity test shown in Table 6.

Table 6. Heteroscedasticity Test Result.

F-statistic	1.714495	Prob. F (5,17)	0.1852
Obs*R-squared	7.710124	Prob. Chi-Square (5)	0.1730
Scaled explained SS	2.118930	Prob. Chi-Square (5)	0.8325

Table 6 shows the results of the heteroscedasticity symptom test using the Breusch Pagan Godfrey test. The probability of Obs*R-squared is 7.710124 indicating that the value is not greater than 5%, so there are no symptoms of heteroscedasticity.

3. Error Correction Model (ECM) Test Results

The ECM estimation used in this study is the Engle-Granger ECM Estimation. The results of the ECM test will yield long-term and short-term relationships between variables. The long-term ECM test results are presented in Table 7.

Table 7. Long-Term ECM Test Results

Variable	Coefficient	Probability	Description
Export Volume	1.056890	0.0000	Significant
Export Price	1.327679	0.0000	Significant
Exchange Rate	-1.183060	0.0014	Significant
GDP per Capita	-0.968003	0.0001	Significant
C	1.617057	0.5729	
R2	0.985316		
F-statistic	335.5124		
Durbin-Watson stat	0.679510		

Based on the results of the long-term regression in Table 7, the following equation is obtained in Equation 6:

$$\text{LNRCAG} = 1.056890\text{LNVXGI} + 1.327679\text{LNHXGI} - 1.183060\text{LNNKURS} - 0.968003\text{LNGDPN} + 1.617057 + Z_t \tag{6}$$

After obtaining the long-term test results, the next step is to test the short-term for each variable. The short-term test starts at the first difference level because all variables are stationary at that level.

Table 8. Short-Term ECM Test Results at the First Difference Level

Variable	Coefficient	Probability	Description
Export Volume	1.098342	0.0000	Significant
Export Price	1.259835	0.0000	Significant
Exchange Rate	1.153360	0.0366	Significant
GDP per Capita	0.430394	0.3486	Not Significant
ECT (-1)	0.110861	0.0441	
C	-0.198618	0.0025	
R2	0.983137		
F-statistic	209.8807		
Durbin-Watson stat	2.317148		

The ECM equation requires the ECT coefficient to be negative and significant; therefore, the test results in Table 8 cannot be used. Another alternative is to estimate the short-term relationships of all variables at the second difference level. Yovirizka and Haryanto (2020), state that a negative ECT coefficient with a probability less than the significance level indicates the validity of the long-term and short-term equilibrium relationships among the variables in the equation.

Table 9. Short-Term ECM Test Results at the Second Difference Level

Variable	Coefficient	Probability	Description
Export Volume	1.050965	0.0000	Significant
Export Price	1.336923	0.0000	Significant
Exchange Rate	-0.609765	0.3363	Not Significant
GDP per Capita	-0.954307	0.1479	Not Significant
ECT (-1)	-0.670012	0.0265	
C	1.617057	0.5729	
R2	0.986333		
F-statistic	245.3819		
Durbin-Watson stat	2.466134		

Based on the short-term regression results in Table 9, the following short-term equation is obtained in Equation 7:

$$LNRCAG = 1.617057 + 1.050965LNVXGI + 1.336923LNHXGI - 0.609765LNNKURS - 0.954307LNGDPN - 0.670012ECT + Zt \qquad (7)$$

Influence of Export Volume on the Competitiveness of Indonesian Palm Sugar

Long-term and short-term estimates indicate that the export volume of Indonesian palm sugar significantly impacts its competitiveness. An increase in the export volume of palm sugar signifies high purchasing power, thereby enhancing the competitiveness of Indonesian palm sugar. Conversely, a decrease in export volume will reduce competitiveness due to diminished market demand. Research by Rosyadi et al. (2021) and Supriana et al. (2022) supports the notion that increasing export volume can enhance export competitiveness. The Ministry of Trade of the Republic of Indonesia (2017) states that the export trend of Indonesian palm sugar has reached more than 20% compared to the average global growth of palm sugar exports at 6%. Export volume greatly influences the competitiveness of palm sugar, attributed to the substantial annual growth of Indonesian palm sugar exports.

Unfortunately, the export volume is still not optimal, as national production is insufficient to meet both domestic and international needs. The knowledge of farmers and producers about maintaining quality and standards, coupled with the varying international market standards, poses challenges to export activities. According to Susi (2013), the quality of palm sugar products can vary, affecting the overall quality of palm sugar. This variability in quality can lower the product's value. Sulaiman et al. (2018) add that increased production capacity is needed to achieve self-sufficiency in sugar by promoting investment in non-cane sugar development.

Influence of Export Price on the Competitiveness of Indonesian Palm Sugar

Long-term and short-term estimates show that export prices significantly affect the competitiveness of Indonesian palm sugar. The price of Indonesian palm sugar in the international market is often determined by its quality, thus affecting its competitiveness. Research by Gul et al. (2013) and Muharami & Novianti (2018) indicate that export prices reflect commodity quality.

The export price trend of Indonesian palm sugar has been fluctuating due to production volume and quality that are still not optimal, given that these two aspects are crucial for the export market. Sari et al. (2020) state that production and price fluctuations of palm sugar commodities are caused by price instability in the market due to factors such as sugar quality and economic conditions at the time.

Another factor influencing export prices is the oligopsonistic market structure of palm sugar. The formation of an oligopsonistic market for palm sugar commodities is due to a limited number of buyers, few large producers, and buyers acting as price setters while sellers act as price takers. Sukiyono et al. (2011) note that the limitation of buyers at the village and upper levels often results in an oligopsonistic market. This can lead to price distortions due to a lack of competition among sellers and asymmetric information provided by buyers.

Influence of Rupiah Exchange Rate on the Competitiveness of Indonesian Palm Sugar

Long-term estimates show that the exchange rate of the IDR against the USD negatively and significantly affects the competitiveness of Indonesian palm sugar, while short-term estimates show no effect. The negative value in the rupiah exchange rate variable indicates that the relationship between the rupiah exchange rate and export competitiveness is inversely proportional. Rochdiani and Wulandari (2023) mention that if the domestic currency depreciates, it will increase export competitiveness. Conversely, if the domestic currency appreciates against foreign currencies, it will tend to reduce export competitiveness.

The insignificant effect was also caused by the influence of the export price variable which had a positive impact on the competitiveness of palm sugar. Taufiq & Natasah (2019) asserted that the increase in Indonesian exports was triggered by the increase in commodity prices in the international market. The impact of the increase in the rupiah exchange rate on exports was not too pronounced, because the overall increase in prices in the international market was more significant. Despite the strengthening of the rupiah, the increase in commodity prices on the global market still provided a strong boost to Indonesian exports.

Influence of GDP per Capita on the Competitiveness of Indonesian Palm Sugar

Long-term estimates show that GDP per capita negatively and significantly affects the competitiveness of Indonesian palm sugar, contrary to the short term which shows no effect. The competitiveness of palm sugar commodities can be influenced by various aspects and there are many business actors at each producer level. This is why Indonesia's GDP per capita does not have a unidirectional effect on the competitiveness of Indonesian palm sugar. Farida and Yuliana (2022) demonstrate that export competitiveness does not directly drive economic growth in developing countries. Indonesia's GDP per capita does not significantly affect the competitiveness of palm sugar because the economy is supported by other variables. Research on rubber commodity exports in Indonesia by Suryanto (2016) show that changes in GDP do not automatically increase the export competitiveness of commodities because GDP is the total income of all components of a country's citizens, including individuals and companies. These companies are very diverse and not only those that require raw materials from rubber. Therefore, changes in GDP variables do not automatically increase the competitiveness of rubber exports.

Competitive Position Analysis Using Export Product Dynamic (EPD)

The method used to analyze the market position of Indonesian palm sugar commodities in the international market is EPD because it can show whether the performance level of Indonesian palm sugar commodities is dynamic or stagnant.

Table 10. Results of the average EPD value analysis of Indonesian palm sugar in the international market for the years 1998-2022

No.	Year	Market Position
1	1998	Retreat
2	1999	Falling Star
3	2000	Lost Opportunity
4	2001-2003	Retreat
5	2004	Falling Star
6	2005-2006	Lost Opportunity
7	2007	Falling Star
8	2008-2011	Rising Star
9	2012-2015	Falling Star
10	2016	Retreat
11	2017	Rising Star
12	2018	Falling Star
13	2019	Retreat
14	2020	Rising Star
15	2021-2022	Lost Opportunity

The calculation results of the EPD for Indonesian palm sugar commodities show a tendency for variability with the RCA analysis results. The competitive position in Table 10 shows an average falling star position, indicating that Indonesian palm sugar tends to be stagnant and not developing in the fluctuating international trade market. This position is followed by a rising star and retreat, then

a lost opportunity. The average share of Indonesian palm sugar exports in the world is 2%, while the contribution of palm sugar commodities in Indonesia is on average 0.01%. This is also in line with the distribution map of Indonesia's export destination countries, which is not very extensive. The United States is the only main export destination country with an export value >14,000 USD, while other destination countries have values <5,000 USD.

From 2008 to 2011, Indonesian palm sugar occupied the rising star position for four consecutive years. This rising star position during those years was due to the increase in the ranking of Indonesian palm sugar in the international market from 42nd place to 35th place in 2008. From 2012 to 2016, Indonesian palm sugar returned to the falling star position. Although during those years, Indonesian palm sugar commodities were comparatively competitive, these commodities had less potential for market development and tended to be stagnant. The rising star position in 2017, 2018, and 2020 was consistent with the increase in the RCA value, with an average of 4.13. The competitiveness value in those years was the highest for palm sugar commodities.

A significant decline occurred again from 2021 to 2022, in line with the RCA analysis, which showed a sharp decline. One of the causes of the decline in the competitiveness of Indonesian palm sugar commodities is the lack of government contribution to the development of palm sugar productivity. Sari et al. (2023) in their research stated that the highest threat factor score was due to the lack of government support for the export potential of coconut sugar products. This is due to the government's lack of attention to understanding consumer needs in target countries for coconut sugar product exports. This opinion is supported by Obie et al. (2019) who stated that unequal government assistance is also a problem faced by palm sugar farmers. The government had assisted in palm sugar production, such as palm sugar production houses and cooking utensils for palm sugar, but not all palm sugar farmers received this assistance.

CONCLUSION AND SUGGESTION

Based on the research results, it can be concluded that Indonesian palm sugar has the potential to develop and expand its global market share. This is evident from the RCA value, which consistently shows a value greater than 1 from 2011-2022, with the highest value in 2018. The main focus factors in improving the competitiveness of Indonesian palm sugar are export volume and export price. These two variables show long-term and short-term effects on the competitiveness of Indonesian palm sugar. The most common competitive condition during the 1998-2022 period was the falling star, followed by rising star and retreat, then lost opportunity.

The discourse on sugar self-sufficiency has not yet succeeded in making palm sugar a substitute for natural sweeteners for the community, even though the optimization of the palm sugar industry can help reduce imported products and meet domestic needs. Indonesian palm sugar products need to be developed starting from the industrial scale, production, quality, and sustainability. The government plays a significant role in providing technical guidance, considering that the knowledge of farmers and producers is still not optimal. Increasing the industrial scale is necessary to support domestic production to meet national and international needs. Palm sugar commodities also require

comprehensive, easily accessible, and updated supporting data so that the public can be informed about the development of palm sugar products in Indonesia.

This study applies several measures to better understand the comparative and competitive competitiveness of the Indonesian palm sugar industry in the international market. The results of this study can be used to draw clear and practical conclusions. This study can also provide a framework for further analyses of other non-rival commodities in Indonesia and at different periods of time.

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